

Attorney Docket No.: RSW920000166US1/5577-311

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: Britton et al.

Group Art Unit No.: 2176

Serial No.: 09/910,083

Examiner: James H. Blackwell

Filed: July 20, 2001

Confirmation No.: 2405

For: ENHANCED TRANSCODING OF STRUCTURED DOCUMENTS THROUGH  
USE OF ANNOTATION TECHNIQUES

**DECLARATION OF KATHRYN BRITTON PURSUANT TO 37 C.F.R. 1.131**

Sir:

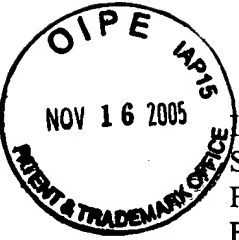
I, Kathryn Britton, hereby declare and say that:

1. I, Roderick Henderson, John Hind, Steven Ims, Max McMullen, Christopher Seekamp, and Brad Topol, are the inventors of the subject matter of the above-referenced patent application.

2. Prior to April 1, 2001, we conceived the subject matter of Claims 1, 4-27, 29, 31, and 32 of the above-referenced patent application.

3. In support of the above statement of Section 2, I hereby submit as **Appendix A** copies of Pages 1, 2 and 6-13 of the written document entitled "Disclosure RSW8-2000-0231 ... A Process for Enhanced Transcoding of HTML Through The Use of Annotation Techniques" which was submitted by the inventors to International Business Machines Corporation ("IBM") prior to April 1, 2001 (see Page 1, indicating that the document was submitted to IBM on November 6, 2000). The description of embodiments of the invention on Pages 6-13 establishes that the subject matter of the above-referenced claims was conceived on or before November 6, 2000. Please note that some portions of the document unrelated to establishing the date of conception and reduction to practice of the subject matter of the above-referenced claims have been redacted.

4. Due diligence was exercised from prior to April 1, 2001, to the filing of the present patent application.

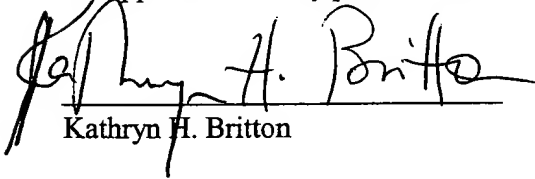


In re: Britton et al.  
Serial No.: 09/910,083  
Filed: July 20, 2001  
Page 2

5. In support of the above statement of Section 4, I hereby submit as **Appendix B** a copy of letters dated June 19, 2001 from IBM Intellectual Property Attorney Jeanine S. Ray-Yarletts to the inventors forwarding a draft of the patent application for their review.

6. In summary, my statements herein and the documents I have concurrently submitted show conception of the invention prior to April 1, 2001, coupled with due diligence from prior to April 1, 2001, to the filing of the application on July 20, 2001.

7. I hereby declare that all statements made herein of my own knowledge are true, and that all statements made on information and belief are believed to be true. I further declare that these statements were made with knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

  
Kathryn H. Britton

7 November 2005  
Date



# APPENDIX A



IBM Socket RSW920000166US1

11/30/00 GA



## Disclosure RSW8-2000-0231

Created By: John Hind Created On: 11/06/2000 03:39:20 PM  
Last Modified By: John Hind Last Modified On: 11/07/2000 01:18:04 PM

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Required fields are marked with the asterisk (\*) and must be filled in to complete the form.

### Summary

Status	Under Evaluation
Processing Location	RSW
Functional Area	Horn: Technology Group (Kopkind, Lindquist)
Attorney/Patent Professional	Jeanine Ray/Raleigh/IBM
IDT Team	Marcia Peters/Raleigh/IBM
Submitted Date	11/06/2000 04:25:17 PM
Owning Division Select	AIM
PVT Score Calculate	To calculate a PVT score, use the 'Calculate PVT' button.
Incentive Program	
Lab	
Technology Code	

### Inventors with Lotus Notes IDs

Inventors: Kathryn Britton/Raleigh/IBM@IBMUS, John Hind/Raleigh/IBM, Steve Ims/Raleigh/IBM@IBMUS, Christopher Seekamp/Raleigh/IBM@IBMUS, Brad Topol/Raleigh/IBM@IBMUS

Inventor Name > denotes primary contact	Inventor Serial	Div/Dept	Manager Serial	Manager Name
Britton, Kathryn	457330	7G/E55A	901547	Anderson III, I C (Iva)
Hind, J R (John)	327592	7G/BRQA	938664	Kopkind, W G (William)
Ims, Steven D (Steve)	781158	7G/BRQA	938664	Kopkind, W G (William)
Seekamp, Christopher R	345110	7G/E55A	901547	Anderson III, I C (Iva)
Topol, Brad B	866757	7G/BRQA	938664	Kopkind, W G (William)

### Inventors without Lotus Notes IDs

Rod Henderson  
Serial Number : (N/A) Company :  
Citizen of : US  
E-Mail :  
Business Address :

Business Phone :  
Home Address :

Max McMullen  
Serial Number : (N/A) Company :  
Citizen of : US  
E-Mail :  
Business Address :

Business Phone :  
Home Address :

**IDT Selection**

<b>IDT Team:</b>	<b>Attorney/Patent Professional:</b>
Marcia Peters/Raleigh/IBM	Jeanine Ray/Raleigh/IBM

**Response Due to IP&L: 12/07/2000**

**Main Idea**

**Title of disclosure (in English)**

A Process for Enhanced Transcoding of HTML Through The Use of Annotation Techniques

**Idea of disclosure**

1. Describe your invention, stating the problem solved (if appropriate), and indicating the advantages of using the invention.

## Reference material - definitions

“Xpath” is a language for addressing parts of an XML document defined by a W3C recommendation document which can be found at <http://www.w3.org/TR/xpath> . It defines, among other things, a core library of functions which every implementation must include which are used to evaluate expressions in the Xpath language. Implementations of Xpath may add additional functions to this core library. For the purposes of this disclosure we make use of an Xpath implementation which has extended it's core library by the addition of a string function named “globb-match” which returns a Boolean representing the result of a case insensitive matching of the first argument string by the globbing pattern in the second argument string (this follows the same implementation pattern as the core library's “contains” string function).

The examples and descriptions in this disclosure assume that both the markup documents (eg the HTML page) and the external annotations are encoded with Unicode character representation. We use the term “case insensitive” meaning that operations occur under a mapping of characters as described by the ‘Unicode Technical Report #21 Case Mappings’ document which can be found at <http://www.unicode.org/unicode/reports/tr21/> .

When we use the term “globbing pattern” we mean a Unicode version of the Unix shell file matching pattern language where, within the pattern string, six characters take on special meaning which drives the action of the implementing matching engine as follows:

- ‘\*’ The asterisk matches zero or more characters.
- ‘?’ The question mark matches one character.
- ‘{’ The left brace marks the the start of a 'multiple choices' region.
- ‘}’ The right brace marks the end of a 'multiple choices' region.
- ‘,’ The comma separates alternate elements in a 'multiple choices' region.
- ‘\’ The backslash is used to quote the next character, causing it to be interpreted literally, and not as a meta-character.

A globbing pattern is a human user-friendly way specifying how to recognize a string as belonging to search result set. Algorithms exist which allow globbing patterns to be translated into a "regular expression" which is a machine friendly pattern notation used by many search engines. Some examples of these pattern transformations are:

Figure 4

Globbing Pattern	Regular Expression	Explanation
"abc"	"^abc\$"	The string "abc"
"abc*def."	"^abc.*def\.\$"	A string starting with "abc" and ending with "def."
"*abc*"	"abc"	A string containing "abc"
"*{ab,cd}*ter."	"(ab cd).*ter\.\$"	A string containing "ab" or "cd" which ends with "ter."

Putting this all together this means that if one wanted to identify paragraphs in an html document which contained a GIF image from internettrafficreport.com, such as this example:

Figure 5

```
<p>
<a href="http://www.wral-tv.com/weather/">
<span style='text-decoration:none;text-underline:none'>

</span>
</a>
<a href="http://www.InternetTrafficReport.com/">
<span style='text-decoration:none;text-underline:none'>

</span>
</a>
</p>
```

One could use the following Xpath specification:

Figure 6

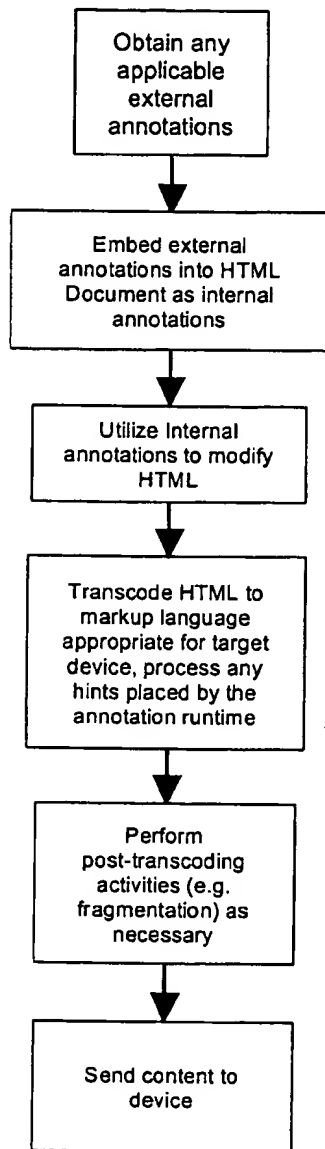
```
/descendant::p[descendant::img[globb-search(@src,"*internettrafficreport.com*.gif*")]]
```



2. How does the invention solve the problem or achieve an advantage,(a description of "the invention", including figures inline as appropriate)?

The process for utilizing annotation to enhance transcoding is depicted in Figure 7. First, any external annotations that exist for the page are obtained, filtered by characteristics and converted into internal annotations. The XPath and take-effect attribute or clause associated with external annotation are utilized to embed the external annotation into the document as internal annotations. Once all annotations have been embedded into the document, the annotation runtime can process the annotations. The annotations are utilized to modify the original HTML content into HTML that is better suited for the automatic transcoding techniques about to occur. These techniques are described in more detail below. Next the modified HTML is passed to the transcoding subsystem which performs the actual content adaptation appropriate for the pervasive device. Finally, any necessary post-transcoding activities (e.g. Fragmentation of content) are performed and the content is sent to the target device.

Figure 7



### **Annotation Techniques**

In this section we describe in more detail the annotation techniques utilized to prime the HTML content for automatic transcoding:

#### **Clipping**

One annotation technique we utilize is clipping. Clipping reduces the amount of content so that only the desired portions of the HTML remain to be transcoded for the device. The clipping model we use is a state based model that has two primary states, keep and remove. When in the remove state, content is removed. When in the keep state content is kept. In addition, individual tag types may be declared as exceptions. For example, one could declare the primary state to be remove but then list IMG's as an exception. In this scenario, all content except images would be removed. The clipping model permits individual nodes, subtrees, and forests from the original

HTML DOM to be clipped.

We have introduced a hint state stack which allows inline annotations to be augmented by page family external annotation definitions. The <push/> element indicates that the current annotation states should be placed on the state stack while the <pop/> element indicates that the annotation states should be set to the values on top of the stack which are then removed from the stack. Here is an example of an external annotation definition which causes all paragraphs containing text which include the string "IBM" and all children markups within these paragraphs to be kept except for image tags which will be removed, notice that <push> and <pop> are used to override and restore the annotation state outside the bounds of these paragraphs:

Figure 8:

```
<description target="/descendant::P[descendant::text()[contains(.,'IBM')]]">
  < take-effect-before>
    <push/><keep/> <remove tag="IMG" />
  </take-effect-before>
  < take-effect-after>
    <pop/>
  </ take-effect-after>
</description>
```

### Node and Attribute Replacement

In some cases it is desirable to see some of the HTML elements or attributes replaced with substitutes more appropriate for the device. For example, in some situations, customers desire to replace image elements with text elements as images do not render well on some pervasive devices. The annotation model we describe enables HTML nodes from the original document to be replaced with new content from the annotation file and also permits attributes to be set with updated values. For example, if we wanted to replace all images with the text "..PIC.." one could use this external annotation:

Figure 9:

```
<description
target="/descendant::IMG[globb-search(@src,'*. {jpg,gif,png} *')]">
  < take-effect-before>
    <push/>
    <replace>
      <text> ..PIC.. </text>
    </replace>
  </take-effect-before>
```

```

< take-effect-after>
    <pop/>
  </ take-effect-after>
</description>

```

### Enhanced Form Support

In some cases, the techniques for automatically transcoding an HTML form lead to undesirable results. For example, labels that are beneath the text field they reference cannot be viewed easily when automatically transcoded to HDML. Furthermore, in order to transcode to VoiceXML it is desirable that forms be composed of select boxes instead of text fields as select boxes are better suited for the voice recognition capabilities of pervasive computing devices. The annotation model we present enables form enhancements to be included as part of the annotation and permits new labels to be provided for input fields as well as permits text fields to be converted into select boxes by providing a supplemental list of options to be used in the creation of the select box.

Figure 10

```

<description take-effect="before"
target="/descendant::FORM[globb-search(@ACTION,'*cgi-bin?getitnow*')]">
<modify>
  <form>
    <text>Submit selection</text>
    <field name="submit" value="retrieve" />
    <text>Choose your country</text>
    <field name="textfield" type="select">
      <option value="japan" label="Japan" />
      <option value="usa" label="USA" />
      <option value="other" label="Other country" />
    </field>
    <field name="hiddenvalue" value="secret" type="hidden" />
  </form>
</modify>
</description>

```

### Fine Grain Transcoding Preference Support

With HTML elements such as tables there may exist several different viable transcoding approaches. For example, some tables may actually be used to mimic form like layout whereas other tables may be used to present tabular data and thus need their column labels preserved and emphasized as they proceed through the transcoding process. For these situations, annotation may be used dynamically select the most appropriate transcoding approach for each table

individually.

Figure 11

```
<description take-effect="before" target="/descendant::TABLE[2]">
  <keep tag="all" />
  <insertattribute name="summary" value="Summary of the table" />
  <table majoraxis="row">
    <column index="*" clipping="remove" />
    <column index="2" clipping="keep" />
    <column index="3" clipping="keep" />
    <row index="*" clipping="remove" />
    <row index="2" clipping="keep" />
    <row index="3" clipping="keep" />
  </table>
</description>
```

### Advantages and Benefits of this Solution

- The use of annotation results in transcoded content that is customized in a fashion desired by the customer, yet still permits the customer to leverage automatic transcoding techniques.
- Because annotation is applied before the content is transcoded into a device specific markup language, a single annotation can be utilized by several different pervasive computing devices. Furthermore, since in many case annotation results in the clipping of the HTML content, it typically results in reducing the amount of content that needs to be passed to the transcoding engine.
- For HTML elements such as tables where there may exist several different viable transcoding approaches, annotation may be used to declare which technique should be used on a per table element basis, thus providing a technique for very fine grained transcoding configuration not previously possible.
- External annotations can be applied to dynamically generated HTML as well as to page families (using content pattern Xpath specification). Characteristic filtering allows a single set of annotations to be used in conjunction with multiple targets with a minimum of authoring effort in a consistent fashion with a sites styling.

3. If the same advantage or problem has been identified by others (inside/outside IBM), how have those others solved it and does your solution differ and why is it better?

4. If the invention is implemented in a product or prototype, include technical details, purpose, disclosure details to others and the date of that implementation.

**\*Critical Questions ( Questions 1 - 7 must be answered)**

# APPENDIX B

TO: Kathryn H. Britton

DATE: June 19, 2001



SUBJECT/Docket #: RSW9-2000-0166-US1 Enhanced Transcoding of Structured Documents  
Through Use of Annotation Techniques

Important Legal Notice to Inventor

Attached for your review is a copy of the above-identified patent application. PLEASE TAKE THE TIME TO REVIEW THE ENTIRE APPLICATION, INCLUDING ALL CLAIMS, FOR COMPLETENESS AND TECHNICAL ACCURACY.

THE LAW IMPOSES A DUTY OF CANDOR AND GOOD FAITH ON INVENTORS. Under the law there is a duty on inventors to disclose all information they are aware of which is material to invention patentability.

INFORMATION IS MATERIAL IF THERE IS A SUBSTANTIAL LIKELIHOOD THAT A PATENT EXAMINER WOULD CONSIDER IT IMPORTANT. For example, information related to prior art having a bearing on the patentability of your claimed invention includes: (a) prior published articles, patents, product announcements, technical reports, lectures or other published material of IBM or others incorporating your invention or which might be considered as pertaining to your invention; (b) any public use of demonstrations of your invention or of apparatus or methods which might be considered as pertaining to your invention; (c) any sale of or offer for sale of products incorporating your invention or made by its use; (d) any commercial machine of which your invention is an improvement; and (e) pertinent work of others, including coworkers, of which you have knowledge.

INFORMATION RELATING TO INVENTOR SHIP SHOULD ALSO BE CONSIDERED. To Be an inventor one must be able to identify his inventive contribution. If you have any question as to whether those named are properly inventors, or someone not named should be added as an inventor, you have a duty to disclose such information so that a legal determination can be made about INVENTOR SHIP.

IT IS ESSENTIAL THAT ALL ITEMS NOTED ABOVE, AS WELL AS ANY OTHER INFORMATION YOU BELIEVE MAY HAVE A BEARING ON THE CLAIMED INVENTION, BE BROUGHT TO MY ATTENTION PROMPTLY. In this manner you can satisfy your duty of disclosure and we can insure that all material information is disclosed.

Jeanine S. Ray-Yarletts  
Intellectual Property Law Attorney  
International Business Machines Corporation

AFTER READING THIS NOTICE PLEASE COMPLETE BELOW, SIGN AND RETURN.

I have the following information or question not previously provided or made about my invention (if none, so state):

None

Kathryn H. Britton

Inventor Signature

July 3, 2001  
Date

TO: **Max A. McMullen**

DATE: **June 19, 2001**

SUBJECT/Docket #: **RSW9-2000-0166-US1 Enhanced Transcoding of Structured Documents Through Use of Annotation Techniques**

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**Jeanine S. Ray-Yarletts  
Intellectual Property Law Attorney  
International Business Machines Corporation**

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**I have the following information or question not previously provided or made about my invention (if none, so state):**

**None** \_\_\_\_\_

 7/9/2001  
Inventor Signature Date



TO: Christopher R. Seekamp

DATE: June 19, 2001

SUBJECT/Docket #:RSW9-2000-0166-US1 Enhanced Transcoding of Structured Documents  
Through Use of Annotation Techniques

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Jeanine S. Ray-Yarletts  
Intellectual Property Law Attorney  
International Business Machines Corporation

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I have the following information or question not previously provided or made about my invention (if none, so state):

☒ None \_\_\_\_\_

Christopher R. Seekamp  
Inventor Signature

6/22/01  
Date

**TO: Roderick C. Henderson**

**DATE: June 19, 2001**

**SUBJECT/Docket #:RSW9-2000-0166-US1 Enhanced Transcoding of Structured Documents  
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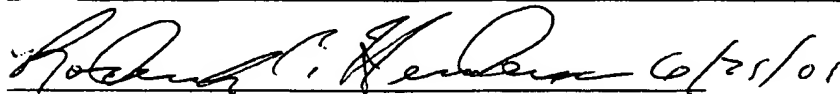
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**Jeanine S. Ray-Yarletts  
Intellectual Property Law Attorney  
International Business Machines Corporation**

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**I have the following information or question not previously provided or made about my invention (if none, so state):**

**None**



**Inventor Signature**

**Date**

TO: John R. Hind

DATE: June 19, 2001

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Jeanine S. Ray-Yarletts  
Intellectual Property Law Attorney  
International Business Machines Corporation

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I have the following information or question not previously provided or made about my invention (if none, so state):

None

Inventor Signature

Date

TO: Steven D. Ims

DATE: June 19, 2001

SUBJECT/Docket #:RSW9-2000-0166-US1 Enhanced Transcoding of Structured Documents  
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Jeanine S. Ray-Yarletts  
Intellectual Property Law Attorney  
International Business Machines Corporation

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I have the following information or question not previously provided or made about my invention (if none, so state):

None

  
Inventor Signature

6/20/2001  
Date

TO: Brad B. Topol

DATE: June 19, 2001



SUBJECT/Docket #: RSW9-2000-0166-US1 Enhanced Transcoding of Structured Documents Through Use of Annotation Techniques

Important Legal Notice to Inventor

Attached for your review is a copy of the above-identified patent application. PLEASE TAKE THE TIME TO REVIEW THE ENTIRE APPLICATION, INCLUDING ALL CLAIMS, FOR COMPLETENESS AND TECHNICAL ACCURACY.

THE LAW IMPOSES A DUTY OF CANDOR AND GOOD FAITH ON INVENTORS. Under the law there is a duty on inventors to disclose all information they are aware of which is material to invention patentability.

INFORMATION IS MATERIAL IF THERE IS A SUBSTANTIAL LIKELIHOOD THAT A PATENT EXAMINER WOULD CONSIDER IT IMPORTANT. For example, information related to prior art having a bearing on the patentability of your claimed invention includes: (a) prior published articles, patents, product announcements, technical reports, lectures or other published material of IBM or others incorporating your invention or which might be considered as pertaining to your invention; (b) any public use of demonstrations of your invention or of apparatus or methods which might be considered as pertaining to your invention; (c) any sale of or offer for sale of products incorporating your invention or made by its use; (d) any commercial machine of which your invention is an improvement; and (e) pertinent work of others, including coworkers, of which you have knowledge.

INFORMATION RELATING TO INVENTORSHIP SHOULD ALSO BE CONSIDERED. To Be an inventor one must be able to identify his inventive contribution. If you have any question as to whether those named are properly inventors, or someone not named should be added as an inventor, you have a duty to disclose such information so that a legal determination can be made about INVENTORSHIP.

IT IS ESSENTIAL THAT ALL ITEMS NOTED ABOVE, AS WELL AS ANY OTHER INFORMATION YOU BELIEVE MAY HAVE A BEARING ON THE CLAIMED INVENTION, BE BROUGHT TO MY ATTENTION PROMPTLY. In this manner you can satisfy your duty of disclosure and we can insure that all material information is disclosed.

Jeanine S. Ray-Yarletts  
Intellectual Property Law Attorney  
International Business Machines Corporation

AFTER READING THIS NOTICE PLEASE COMPLETE BELOW, SIGN AND RETURN.

I have the following information or question not previously provided or made about my invention (if none, so state):

None

Inventor Signature

Date